

EXHIBIT E

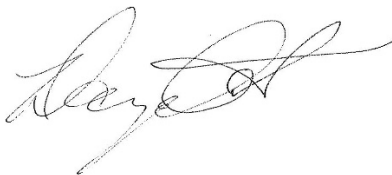
November 16, 2019

Rachel Miller et al. v. Hughs

**United States District Court for the Western District of Texas
Austin Division**

Expert Report of Dr. Darren Grant

**133 Pine Valley St.
Huntsville, Texas 77320**

A handwritten signature in black ink, appearing to read "Dr. Darren Grant", is positioned above a horizontal line.

I. INTRODUCTION AND SUMMARY OF FINDINGS

I have been retained by Plaintiffs' counsel as an expert witness in the case named above. I have been asked to provide my analysis and opinions about the effect of the order of the names of candidates on ballots ("ballot order") on electoral outcomes in Texas primary and primary runoff elections.

The way in which ballot order is determined in Texas differs by the type of election. Primary elections and primary runoffs are within-party elections; in these, ballot order is determined by a public drawing that is held by the county chair of each party. When this procedure is followed appropriately, candidates' ballot order will vary, randomly, from county to county. In the general election, which pits the parties' nominees against each other, ballot order is determined by the number of votes received in the previous gubernatorial election. The party receiving the most votes is placed first on the ballot, in all races; the party receiving the next-most votes is placed second, and so on.

I have been asked to discuss my own work studying the effect of ballot order on vote shares in the 2014 Texas primary and primary runoff elections, which drew on the fact that ballot order in these elections is putatively randomly determined.

My research on Texas primary and primary runoff elections finds substantial, statistically significant, and empirically robust effects of ballot order on vote share. This effect occurs in both parties, in primaries and in primary runoffs, and in elections for legislative, executive, and judicial positions. Its magnitude is largely unaffected by county demographics.

The magnitude of this "ballot order effect," however, does differ by election. Broadly speaking, when voters are less likely to know about one or more candidates on the ballot, the ballot order effect is larger. In my study, the largest ballot order effects were found in the Republican primaries for statewide judicial offices--seats on the Supreme Court or the Court of Criminal Appeals. There, the size of the ballot order effect was approximately 8 percentage points. That is, switching the ballot order of the candidates in a two-candidate race (all but one race involved two candidates) would add about 8 percentage points to the vote share of the person moving from second to first, and would subtract 8 percentage points from the vote share of the person moving from first to second. By any standard, these effects are not just statistically significant, but large.

The smallest effects were found in the Republican primaries for Governor and U.S. Senator, which either featured a well-known incumbent (U.S. Senator John Cornyn) or a well-known politician aspiring to higher office (longtime Texas Attorney General Greg Abbott). There, the size of the ballot order effect was about 1 percentage point. A candidate moving from first to second on the ballot in these multi-candidate contests would lose about 1 percentage point of vote share, while a candidate moving from second to first would gain 1 percentage point. These effects, while smaller than those for judicial elections, are still statistically significant.

In the other primary elections—Republican primaries for other statewide positions such as Comptroller or Land Commissioner, and all Democratic primaries (which featured no politicians who were well-known statewide)—the magnitude of the ballot order effect typically fell in

between these two extremes. A candidate who moved from second to first in ballot order would see a rise in vote share of about 2 percentage points; a candidate who moved from last to first in a multi-candidate election would see a rise in vote share of about twice that much. In the primary runoffs, the magnitude of the ballot order effect was about 3 percentage points. Switching the two candidates' ballot orders would add 3 percentage points to the share of the candidate moving to first position and remove 3 percentage points from the share of his or her opponent—a net change in the vote margin (winner-loser) of 6 percentage points.

In summary, my research on the ballot order effect in Texas's 2014 primary and primary runoff elections concluded that:

- In the highest-profile elections with well-known candidates, the first-position advantage was about 1 percentage point in vote share;
- In the lowest-profile elections, for judicial office, the first-position advantage was about 8 percentage points in vote share;
- In the remaining elections, most of which were for statewide executive positions, the first-position advantage was between 2 and 7 percentage points, depending on the contest examined and the alternative to first position (being listed 2nd, or 3rd, or last, etc.).

In Texas primary elections, the magnitude of these ballot order effects is at least as large as in studies of comparable races in other states. This fact, combined with a body of evidence that the ballot order effect is also found in general elections in a variety of other states, indicates that it should also apply to general elections in Texas.

I am being compensated at the rate of \$300 per hour except for deposition and trial, which are compensated at the rate of \$450 per hour. My compensation is not dependent on the conclusions of this report.

II. QUALIFICATIONS

I received a Ph.D. in Economics in 1995 from Florida State University. From 1995 to 2001 I served as an assistant professor of economics at Georgia Southern University. From 2001 to 2007 I served as a senior lecturer at The University of Texas at Arlington, where I was also the coordinator of their Masters program in Health Care Administration from 2001 to 2004. I joined the economics department at Sam Houston State University in Huntsville, Texas, as an assistant professor in 2007, and was promoted to associate professor with tenure in 2011. I continue to serve in this position today.

I have published research in applied microeconomics for over twenty years. I have published on a range of topics, including labor economics, health economics, industrial organization, and “public choice”—a field of economics that closely overlaps with, and draws on, political science. In this research, I have used a wide range of econometric methods, and I recently

published a graduate-level textbook on applied economic research methodology.¹ Combined, my papers have been cited hundreds of times, and I am regularly asked to serve as a referee for major economics journals in a variety of fields, and occasionally for a top political science journal, the *American Political Science Review*, as well.

My work concerns politics and voting in several ways. At all three universities where I have worked, I have taught a course on the economics of public policy; political decision-making is an important part of that course. In addition, I have published three papers on the topic of voting, the most recent in 2017.² Other recently published work falls under the category of “behavioral economics,” the field of economics associated most closely with behavioral phenomena like sequencing effects, in which the order in which items are presented for consideration influences the rating or ranking given to such items.³ Finally, I have forthcoming research (recently accepted by a peer-reviewed statistics journal) which develops statistical methods for testing the randomness of a “set of orderings,” such as the set of ballot orderings that occurs in primary elections for statewide office in Texas.⁴ A copy of my curriculum vitae accompanies this report.

My study of the effect of ballot order on electoral outcomes began with the award of a grant in 2015 to study the subject using Texas data. That research, on which much of this report is based, was published in 2017. Unexpectedly, it uncovered statistical evidence that ballot order in some of the elections studied was not universally randomly determined across all counties, as required by law. In some races, candidates who were well-known or were more acceptable to the party “establishment” were particularly likely to be listed first on the ballot. For elections with three or more candidates, however, the tests I used for this purpose were improvised—there was no “standard” or conventional method in use. Accordingly, I initiated subsequent research with two colleagues in the field of statistics at The University of Washington, in which we developed statistical methods for testing the randomness of ballot orderings in statewide primary races in Texas. (Statistical tests can be employed because such randomizations are conducted repeatedly in statewide races, once in each county.) That research, which confirmed violations of randomness in several 2014 Texas primaries, is forthcoming in a well-known statistics journal, as noted above. Earlier this month, I submitted a grant application for further, more general research on this subject.

¹ *Methods of Economic Research: Craftsmanship and Credibility in Applied Microeconomics*, New York: Springer (2018).

² Grant, Darren. “The Ballot Order Effect is Huge: Evidence from Texas,” *Public Choice* 172, 3:421–442 (2017). Grant, Darren, and Michael Toma. “Elemental Tests of the Traditional Rational Voting Model,” *Public Choice*, 137,1:173-195 (2008). Grant, Darren. “Searching for the Downsian Voter with a Simple Structural Model,” *Economics and Politics*, 10, 2: 107-126 (1998).

³ Grant, Darren. “The Essential Economics of Threshold-Based Incentives: Theory, Estimation, and Evidence from the Western States 100,” *Journal of Economic Behavior and Organization* 130:180-197 (2016). Grant, Darren, and William B. Green. “Grades as Incentives,” *Empirical Economics* 44,3:1563-1592 (2013).

⁴ Grant, Sheridan, Michael Perlman, and Darren Grant. “Targeted Testing for Bias in Order Assignment, with an Application to Texas Election Ballots,” *Journal of Statistical Planning and Inference*, forthcoming.

III. ADVANTAGES RESULTING FROM BALLOT ORDER

Ideally, an election ballot is a neutral mechanism in which voters register their preferences with fidelity. It should minimize voting errors and have no influence on a voter's candidate choice; failing that, it should neither systematically advantage nor disadvantage any candidate, political party, etc. If some aspect of ballot design systematically distorts those preferences, there is value in attempting to minimize the extent of error or in mitigating its effect so that the collective results of the election are largely unaffected, even if individual results may be skewed.

Reality can fall short of this ideal for several reasons. Ballot design can give an advantage to a party or candidate. Some voting systems may complicate the act of voting and confuse voters, causing errors. Mental fatigue can lead voters to make errors. Finally, voters might be ambivalent (or uninformed) about all candidates in a particular race, and may simply select one, though that candidate is not actively preferred to any other.

Psychological factors can also contribute to the ballot order effect. Psychologists, political scientists, and economists have identified various reasons why the sequencing of a set of options can influence how people select among those options. One hypothesis is that people “tend to evaluate objects with a confirmatory bias,” looking for reasons to accept rather than reject them.⁵ Then voters may engage in “satisficing”—picking the first acceptable candidate they see, lending an advantage to candidates listed higher on the ballot. Alternatively, as individuals work through a list of options, mental fatigue can lend an advantage to the objects listed earlier in the sequence. Finally, the assessment of any one item in a sequence may be influenced by a comparison with its predecessor, in ways that can lead to order effects.⁶

All these reasons can cause the order in which candidates are listed on a ballot to influence the share of the vote that they ultimately receive. In practice, these influences often favor candidates who are listed higher on the ballot, giving rise to the “ballot order effect.”

The empirical evidence supporting the ballot order effect in U.S. elections is quite strong. Including my own work, there were at least 11 studies published between 1998 and 2017, all but one peer-reviewed, that estimated the size of the ballot order effect across a variety of American elections.⁷ Nine of these studies--and all of those published within the last 11 years--find a ballot

⁵ Krosnick, J. “Response Strategies for Coping with the Cognitive Demands of Attitude Measures in Surveys,” *Applied Cognitive Psychology* 5:213-236 (1991). Miller, J., and J. Krosnick. “The Impact of Candidate Name Order on Election Outcomes,” *Public Opinion Quarterly* 62:291-330 (1998).

⁶ Mussweiler, T. “Comparison Processes in Social Judgment: Mechanisms and Consequences,” *Psychological Review* 110:472-489 (2003). Damisch, L., T. Mussweiler, and H. Plessner. “Olympic Medals as Fruits of Comparison? Assimilation and Contrast in Sequential Performance Judgments,” *Journal of Experimental Psychology: Applied* 12:166-178 (2006).

⁷ Alvarez, R.M., B. Sinclair, and R. Hasen. “How Much Is Enough? The ‘Ballot Order Effect’ and the Use of Social Science Research in Election Law Disputes,” *Election Law Journal* 5:40-56 (2006). Brockington, D. “A Low Information Theory of Ballot Position Effect,” *Political Behavior* 25:1-27 (2003). Chen, E., G. Simonovits, J. Krosnick, and J. Pasek. “The Impact of

order effect that is statistically significant and favorable to the first-listed candidate. One additional study estimated how the composition of elected officials changed when an alphabetical ordering system was changed to a randomized system in primary elections in four states.⁸ Randomization shifted the alphabetical distribution of elected officials away from surnames that came earlier in alphabetical order. Overall, the use of alphabetic ordering in 16 states determined the identity of an average of 71 state legislators and 10 members of Congress per term. While this set of studies is not exhaustive,⁹ it does constitute an adequate body of evidence that ballots with a uniform candidate ordering are not, generally, neutral mechanisms, because this order is likely to influence those candidates' vote share.

Many jurisdictions take care to reduce this "ballot order effect," either by requiring ballot order to be determined randomly or for ballot order to be rotated across precincts or legislative districts, thereby either randomizing or balancing out the impacts of ballot order across candidates, so as to not institutionalize any systemic favoritism of a particular candidate or type of candidate or political party. Texas itself does precisely that in its primary and primary runoff elections. Such is not the case in Texas general elections.

Candidate Name Order on Election Outcomes in North Dakota," *Electoral Studies* 35:115-122 (2014). Grant, Darren. "The Ballot Order Effect is Huge: Evidence from Texas," *Public Choice* 172, 3:421-442 (2017). Meredith, M., and V. Salant. "On the Causes and Consequences of Ballot Order Effects," *Political Behavior* 35:175-197 (2013). Krosnick, J., J. Miller, and M. Tichy. "An Unrecognized Need for Ballot Reform: The Effects of Candidate Name Order on Election Outcomes," in *Rethinking the Vote: The Politics and Prospects of American Election Reform*, Oxford University Press, pp. 51-73 (2004). Miller, J., and J. Krosnick. "The Impact of Candidate Name Order on Election Outcomes," *Public Opinion Quarterly* 62:291-330 (1998). Pasek, J., D. Schneider, J. Krosnick, A. Tahk, E. Ophir, and C. Milligan. "Prevalence and Moderators of the Candidate Name-Order Effect: Evidence from Statewide General Elections in California," *Public Opinion Quarterly*, 78:416-439 (2014). Koppell, J., and J. Steen. "The Effects of Ballot Position on Election Outcomes," *Journal of Politics* 66:267-281 (2004). Ho, D., and K. Imai. "Randomization Inference with Natural Experiments: An Analysis of Ballot Effects in the 2003 California Recall Election," *Journal of the American Statistical Association* 101: 888-900 (2006). Ho, D., and K. Imai. "Estimating Causal Effects of Ballot Order from a Randomized Natural Experiment." The study by Krosnick, Miller, and Tichy does not appear to be peer-reviewed.

⁸ Edwards, Barry. "Alphabetically Ordered Ballots and the Composition of American Legislatures," *State Politics and Policy Quarterly* 15,2:171-191 (2015). The states were Florida, Indiana, New Hampshire, and Rhode Island. A similar effect showed up in cross-section comparisons as well, i.e., comparisons between states that alphabetized ballot order and those that did not.

⁹ Omitted studies include experimental studies, studies of foreign elections, and studies of American elections that were published before 1998, which I excluded in order to focus solely on modern studies, which utilize the empirical methods most commonly accepted today. All three sets of studies I excluded generally confirm the ballot order effect. Citations of experimental and foreign studies can be found in Edwards, *supra* note 8; citations of earlier American studies can be found in Miller and Krosnick, *supra* note 7.

IV. THE EFFECT OF BALLOT ORDER IN TEXAS PRIMARY AND PRIMARY RUNOFF ELECTIONS

My study of Texas's 2014 primary and primary runoff elections was motivated by omissions in the literature. It was the first study in at least twenty years to examine judicial primary elections or runoff elections of any sort, or to study data from a southern state. It thus significantly expanded the range of elections that have been analyzed in this literature.

This study focused on the March 2014 Democratic and Republican primary elections and the May 2014 Democratic and Republican primary runoff elections for all offices elected statewide. This included one seat in the U.S. Senate, a variety of executive offices including Governor and Lt. Governor, and seats on both of Texas' top courts, the Supreme Court and the Court of Criminal Appeals. The number of individuals contesting these positions ranged from one to eight. (Obviously, races with one candidate were not analyzed.)

The first and most laborious step in conducting the study was determining ballot order in each Texas county holding that election, often by obtaining a sample ballot from a county election official (often the county clerk). At the time, some counties did not hold primaries or runoffs, in one party or the other, but with persistent effort I was able to obtain ballot order for virtually 100% of counties holding primaries and about 97% of counties holding primary runoffs.¹⁰

To this data I appended the vote shares for each candidate in each race in each county, taken from the Texas Secretary of State's "Historical Election Results" online. I also gathered data on a set of basic "control variables" describing the county's demographics, economics, and politics, which could influence voter preferences.¹¹

With this data I then conducted a county-level statistical analysis that related candidates' vote shares to ballot order and (in some estimates) these control variables. The general technique used in the analysis, regression, is common in this literature and in political science and economics

¹⁰ Especially in some of Texas' less populous counties, record-keeping was not meticulous, and it was not unusual for a county to have sample ballots for primaries but not for runoffs. The ballot requests came about one year after the primary/runoff had concluded, well within the window in which election materials were to be retained, but long enough for some counties to misplace those materials.

¹¹ These were as follows. Demographic controls include the fractions of the population that are Anglo, black, and Hispanic; the percentage of adults with at least a high school diploma and with a college degree; the percentage of housing that is owner-occupied; and median age. Variables related to the health and structure of the economy include per capita income, the unemployment rate, mean annual rainfall, and the log of the value of agricultural production. Also included are the logarithms of population, area, the number of registered voters, the number of voters in that election, and the number of votes received by that party's 2012 Presidential nominee (John McCain or Barack Obama). Data sources for these variables were the U.S. Census, the U.S. Department of Agriculture, the Texas Secretary of State, and the Texas Association of Counties. The most recent available measure of each was used, as of 2015; the vintages range from 2010 (for owner-occupied housing) to 2014 (for unemployment).

generally; the specific type of regression, “Seemingly Unrelated Regression” is less common, but has been used repeatedly in both fields for decades.

The fact that ballot order should be randomized across counties should obviate the need for regression; in theory, a simple difference of means should do. However, incorporating control variables into the analysis via regression can improve the accuracy and precision of the estimates. More importantly, it also allows the effects of ballot order manipulation to be investigated. Statistical tests in Grant (2017) and superior tests in a subsequent paper, Grant, Perlman, and Grant (forthcoming) find evidence of ballot order manipulation in a number of races. In many of these races, the extent of manipulation was small—just a few counties, according to tests in Grant, Perlman, and Grant—but in a few races, it was substantial. Such manipulation will bias estimates if, and only if, it is systematically related to candidates’ vote shares in the counties in which manipulation occurs. My analysis took care to check for this and found that this largely did not come to pass.

The findings of this study are summarized in Table 1. For each contest, this table reports the effect on a candidate’s vote share of being listed in any given ballot position, compared to being listed last. Furthermore, each entry of the table (position by contest) generally has three estimates, with increasing numbers of control variables. These controls were included as a “robustness check” arising from concern about ballot order manipulation in some races. In almost every instance, the three estimates are very similar, indicating that any ballot order manipulation has a very small or nil effect on the estimates.

For first position, there are statistically significant ballot order effects in almost every race; even those few estimates that are not statistically significant are positive. These estimates largely conform to the notion that ballot order effects are greatest when voters know less about the candidates in a race.

Even the two highest-profile races, featuring two well-known politicians, were not immune from ballot order effects, but they were smaller than in other races. In those two races, the Republican primaries for Governor and U.S. Senator, the top-listed candidate received a ballot order “bonus” of about 1 percentage point in vote share. Other state executive positions had a ballot order effect of 2 to 7 percentage points, with a median effect of about 4 percentage points. The judicial primaries—which all occurred on the Republican side—had enormous ballot order effects of about 8 percentage points in vote share. By any standard, these numbers are not just statistically significant, but large.

In multi-candidate races, to determine the ballot order effect between the candidates listed in any two given ballot positions, it is necessary to subtract the estimate for the one position from that for the other position. Usually, the effect from being in the third position or further down on the ballot is small or nil. Furthermore, the estimated ballot order effect is invariably largest for first position. Thus, there is an advantage for being in first position on the ballot relative to second position. In my study of primary elections, this effect remains about 1 percentage point for the Governor and U.S. Senate primaries mentioned above and is about 2 percentage points for the other positions. (Most judicial primaries had just two candidates, as did all runoffs, of course.)

Since the analysis is conducted in terms of vote *share*, the effect on the vote *margin* is doubled. In a two-candidate race with a first-position ballot order effect of 1 percentage point, switching the ballot orders of Candidates A and B would lower the one candidate's vote share by 1 percentage point and raise the others by 1 percentage point, causing a 2 percentage point shift in the margin between the two candidates. This is a sizeable effect in politics.

Table 1. Estimates of the Ballot Order Effect on Candidates' Percentage of the Vote, from Grant (2017). Seemingly Unrelated Regression coefficient estimates with controls are found in the center of each cell, estimates without controls in parentheses, and estimates that also control for other races' ballot order in brackets.

	First Position	Second Position	Third Position	Fourth Position	Approx. Standard Error
<i>Democratic Primary</i>	(5.46)	(1.51)	(1.06)	(-0.77)	(0.53)
U.S. Senator	5.95 [5.61]	1.31 [1.24]	0.92 [0.60]	-0.69 [-0.80]	0.52 [0.52]
Governor	(7.83) 4.02 [4.11]	0			(2.37) 1.14 [1.17]
Agriculture Comm.	(4.24) 4.68 [4.63]	(1.73) 1.89 [1.93]	0		(0.82) 0.71 [0.71]
Railroad Comm.	(7.44) 7.39 [7.52]	0			(0.95) 0.87 [0.90]
<i>Republican Primary</i>	(1.50)	(0.10)	(0.07)	(-0.07)	(0.13)
U.S. Senator	1.49 [1.42]	0.22 [0.17]	0.07 [0.03]	-0.05 [-0.08]	0.13 [0.13]
U.S. Senator: Ballot Positions 5-8	(0.08) 0.05 [0.00]	(-0.40) -0.34 [-0.39]	(-0.28) -0.27 [-0.31]	0	(0.13) 0.13 [0.13]
Governor	(0.54) 0.52	(-0.10) -0.03	(-0.09) -0.10	0	(0.18) 0.15
Lt. Governor	(1.78) 2.00	(1.13) 1.42	(-0.29) 0.23	0	(0.73) 0.60
Attorney General	(4.63) 4.69 [4.60]	(1.98) 1.31 [1.25]	0		(0.66) 0.60 [0.61]
Comptroller	(3.23) 2.88 [2.98]	(1.72) 1.12 [1.17]	(0.79) 0.47 [0.64]	0	(0.55) 0.46 [0.46]
Land Commissioner	(2.28) 2.18 [2.16]	0			(0.59) 0.52 [0.52]

Agriculture Comm.	(5.86) 5.67 [5.55]	(2.82) 2.38 [2.34]	(2.39) 2.23 [2.16]	(-0.15) 0.31 [0.30]	(0.75) 0.67 [0.69]
Railroad Comm.	(3.90) 3.83 [3.90]	(1.95) 1.86 [1.94]	(-0.12) -0.03 [0.03]	0	(0.60) 0.59 [0.59]
Chief Justice, Supreme Court	(10.09) 10.48 [10.52]	0			(0.90) 0.72 [0.72]
Supreme Court, Place 6	(8.95) 8.90 [8.83]	0			(0.72) 0.64 [0.65]
Supreme Court, Place 8	(7.68) 6.99 [7.00]	0			(0.62) 0.56 [0.56]
Court of Criminal Appeals, Place 3	(8.40) 8.98 [9.01]	0			(1.03) 1.00 [1.01]
Court of Criminal Appeals, Place 4	(5.00) 5.50 [5.53]	(3.48) 3.47 [3.49]	0		(0.53) 0.46 [0.46]
Court of Criminal Appeals, Place 9	(9.03) 9.61 [9.49]	0			(0.86) 0.74 [0.74]
<hr/>					
<i>Democratic Runoff</i> U.S. Senator	(4.82) 3.74	0			(1.92) 1.68
Agriculture Comm.	(1.71) 1.74 [1.58]	0			(1.47) 1.47 [1.49]
<hr/>					
<i>Republican Runoff</i> Lt. Governor	(2.21) 2.32 [2.44]	0			(1.35) 1.24 [1.25]
Attorney General	(2.54) 2.51 [2.47]	0			(0.94) 0.89 [0.90]

Agriculture Comm.	(5.36)	0	(1.37)
	5.25		1.17
	[5.41]		[1.18]
Railroad Comm.	(3.78)	0	(1.08)
	3.40		1.00
	[3.42]		[1.01]

Note: The last position on the ballot is indicated with a zero. If a zero is missing, the race had five candidates. The controls used in the middle set of estimates are listed in footnote 11. The bracketed estimates also control for ballot position in the Democratic Senatorial Runoff (for Democratic races) or for whether Greg Abbott and Dan Patrick were listed first on the ballot for Governor and Lt. Governor (for Republican races).

A final question investigated by my study involved the variability of the ballot order effect within Texas. To investigate, I used more elaborate regressions to estimate whether the ballot order effect varied substantially with county-level demographics, income, education, and more. The findings consistently indicated that estimates of the ballot order effect were quite stable, varying little in magnitude with any of these factors.¹²

These findings, in turn, suggest that Texas' ballot order effect is likely to be comparable to that in other states. A direct comparison can be conducted with a limited number of primary elections in California (studied by Ho and Imai, 2008) and New York (studied by Koppell and Steen, 2004). The comparison is presented in Table 2, which presents the average gain in vote share that comes from being listed first on the ballot. In two comparable contests (same office, same party), my estimated ballot order effect in Texas is somewhat larger than in New York. Comparing seven comparable elections in Texas and California, the two estimates are within one percentage point in three contests, higher in Texas in two contests, and higher in California in two contests. The mean effect across all of these contests is slightly higher in Texas.

Overall, then, the ballot order effect in Texas primary elections is comparable to that in similar primaries in other states. There is no evidence that the ballot order effect is particularly small in Texas; rather, if anything, the data suggests the opposite.

¹² See Table 5 and Section 5.4 of Grant, *supra* note 7.

Table 2. Average Gain in Vote Share, in Percentage Points, for Being Listed First on the Ballot.

Office Studied	Democratic Primary			Republican Primary	
	Grant (2017) <i>Texas</i>	Ho and Imai (2008) <i>California</i>	Koppell and Steen (2004) <i>New York</i>	Grant (2017) <i>Texas</i>	Ho and Imai (2008) <i>California</i>
U.S.Senate	5.6 (0.5)	1.5 (0.5)	2.4 ($p < .01$)	1.5 (0.1)	2.8 (1.0)
Governor	4.0 (1.1)	0.6 (0.5)	3.1 ($p < .01$)	0.6 (0.2)	0.6 (0.4)
Lt. Governor	---	5.6 (2.8)	2.4 ($p < .01$)	1.5 (0.6)	5.4 (2.7)
Attorney General	----	4.6 (2.0)	2.9 ($p < .01$)	4.0 (0.6)	4.8 (1.8)
Controller / Comptroller	----	3.3 (1.0)	----	2.4 (0.5)	2.1 (1.0)

Note: This is the gain in vote share relative to an average of all other ballot positions. This is reported directly Table 5 of Ho and Imai (2008) and calculated from Table 4 in Grant (2017) and from Table 1 in Koppell and Stein (2004). Estimates formed by averaging the “candidate specific ballot order effect” implied in Table 3 of Koppell and Stein are similar. The standard errors reported for Grant (2017) are for the effects of an individual ballot position, relative to being placed last.

V. CONCLUSION

The ballot order effect is a pervasive phenomenon in American elections, occurring in elections for local, state, and federal office, in partisan and non-partisan elections, in primaries, runoffs, and general elections. It is also pervasive in Texas primary and primary runoff elections. My previous research demonstrates that ballot order has a significant impact in these elections, with a median effect of about 4 percentage points, but that the effect can be twice that much or even more in the most affected races.

VITA

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Positions Held:

**Associate Professor of Economics, Sam Houston State University, 2011-present.
Assistant Professor of Economics, Sam Houston State University, 2007-2011.**

Senior Lecturer and Health Care Administration Master's Program Coordinator (2001-2004), Department of Economics, University of Texas at Arlington, 2001-2007.

Duties included teaching, managing admissions, supervising student research projects and internships, recruiting, working with faculty, and representing the program internally and externally. Under my leadership the Health Care Administration Program, which contained about fifteen students in the summer of 2001, grew to one hundred forty students over three years.

Assistant Professor of Economics, Georgia Southern University, 1995-2001.

**Graduate Teaching Assistant, Florida State University, 1991-1995.
Graduate Research Assistant, Florida State University, 1990-1991.**

High School Teacher and Cross Country Coach, New Orleans, LA, 1987-1990.

Oceanographic Researcher/Analyst (geophysical fluid dynamics), National Space Technology Laboratories (now Stennis Space Center), MS, 1984-1987.

Education:

Ph. D., Economics, Florida State University, April 1995.

***Dissertation:* "Essays on Wages and Employment over the Life Cycle and the Business Cycle."**

***Fields:* Labor, Applied Econometrics, Industrial Organization.**

B. S., Mathematics, summa cum laude, Florida State University, April 1984. Minor: Computer Science.

Teaching Experience:

Lower Division: Introductory Economics (5 sections), Principles of Macro (4 sections), Principles of Micro (lots of sections, a few online);

Upper Division: Intermediate Micro (7 sections, one online), Labor Economics (10 sections), Health Economics (13 sections), Economics of Social Issues and Public Policy (13 sections), Managerial Economics (1 section), Introduction to Econometrics (3 sections), Business Statistics (1 section), Mathematical Economics (1 section);

Graduate: Managerial Economics (10 sections), Health Economics (5 sections), Labor Economics (7 sections), Foundations of Economics (2 sections), Statistical Analysis (2 sections);

Interdisciplinary Seminars: “Civil Rights in America in the 20th Century: Philosophy and Policy,” GSU Bell Honors Program (3 sections); “The Shape of Things to Come: Analyzing Current Policy Issues,” GSU Bell Honors Program (1 section); “Senior Seminar,” on topical business issues, GSU College of Business (3 sections); “American Health: The Crossroads of Business, Science, and Morality,” SHSU Honors Program (1 section);

Supervised Research, Internships, Independent Studies, and Projects: M.S. Economics Master’s Thesis: 1 student; M.S. Health Care Administration Supervised Research (three to nine credit hours, mostly primary research): 16 students; M.S. Health Care Administration Internships or Residencies: 5 students; M.B.A. or M.S. (Finance) Graduate Independent Studies: 3 students; Undergraduate Honors Projects: 9 students.

Published and Forthcoming Papers and Books:

Grant, Sheridan, Perlman, Michael, and Darren Grant. “Targeted Testing for Bias in Order Assignment, with an Application to Texas Election Ballots,” *Journal of Statistical Planning and Inference*, forthcoming.

Grant, Darren. *Methods of Economic Research: Craftsmanship and Credibility in Applied Microeconomics*. New York: Springer (2018). (Heavily reviewed, but not refereed in the formal sense.)

Grant, Darren. “The Ballot Order Effect is Huge: Evidence from Texas,” *Public Choice* 172, 3:421–442 (2017).

Grant, Darren. “The Essential Economics of Threshold-Based Incentives: Theory, Estimation, and Evidence from the Western States 100,” *Journal of Economic Behavior and Organization* 130:180-197 (2016).

Grant, Darren. “A Structural Analysis of U.S. Drunk Driving Policy,” *International Review of Law and Economics* 45:14-22 (2016).

- Grant, Darren. "What Makes a Good Economy? Evidence from Public Opinion Surveys," *Economic Inquiry* 52, 3:1120-1136 (2014).
- Grant, Darren, and John A. Lewis. "Zero Tolerance." In J. Mitchell Miller, ed., *Encyclopedia of Theoretical Criminology*. Hoboken, NJ: John Wiley (2014). (Invited, not refereed.)
- Grant, Darren, and William B. Green. "Grades as Incentives," *Empirical Economics* 44,3:1563-1592 (2013).
- Depken, Craig II, and Darren Grant. "Multiproduct Pricing in Major League Baseball: A Principal Components Analysis," *Economic Inquiry* 49,2:474-488 (2011).
- Grant, Darren. "Dead on Arrival: Zero Tolerance Laws Don't Work," *Economic Inquiry* 48,3:756:770 (2010).
- Grant, Darren. "Physician Financial Incentives and Cesarean Delivery: New Conclusions from the Healthcare Cost and Utilization Project," *Journal of Health Economics*, 28,1:244-250 (2009).
- Grant, Darren, and Michael Toma. "Elemental Tests of the Traditional Rational Voting Model," *Public Choice*, 137,1:173-195 (2008).
- Grant, Darren, and Kelly C. Alfred. "Sanctions and Recidivism: An Evaluation of Physician Discipline by State Medical Boards," *Journal of Health Politics, Policy and Law*, 32,5:867-885 (2007).
- Grant, Darren. "Grades as Information," *Economics of Education Review*, 26, 2:201-214 (2007).
- Grant, Darren. "Information and Sorting in the Market for Obstetrical Services," *Health Economics*, 14, 7: 703-719 (2005).
- Grant, Darren. "Explaining Source of Payment Differences in U.S. Cesarean Rates: Why Do Privately Insured Mothers Receive More Cesareans than Mothers Who Are Not Privately Insured?," *Health Care Management Science*, 8, 1: 5-17 (2005). (lead article)
- Grant, Darren, and Steven Rutner. "The Effect of Bicycle Helmet Legislation on Bicycling Fatalities," *Journal of Policy Analysis and Management*, 23, 3: 595-611 (2004).
- Grant, Darren, and Melayne Morgan McInnes. "Malpractice Experience and the Incidence of Cesarean Delivery: a Physician-level Longitudinal Analysis," *Inquiry*, 41, 2: 170-188 (2004).

Grant, Darren. "The Effect of Implicit Contracts on the Movement of Wages over the Business Cycle: Evidence from the National Longitudinal Surveys," *Industrial & Labor Relations Review*, 56, 3: 393-408 (2003).

Grant, Darren. "A Comparison of the Cyclical Behavior of Union and Nonunion Wages in the United States," *The Journal of Human Resources*, 36, 1: 31-57 (2001).

Grant, Darren. "Race and Cesarean Delivery in Florida," *The Review of Black Political Economy*, 28, 1: 37-47 (2000).

Grant, Darren. "Recycling and Market Power: A More General Model and Re-evaluation of the Evidence," *International Journal of Industrial Organization*, 17, 1: 59-80 (1999).

Grant, Darren. "Searching for the Downsian Voter with a Simple Structural Model," *Economics and Politics*, 10, 2: 107-126 (1998). (lead article)

Completed Papers (Under Review or Under Revision):

Grant, Darren. "Politics, Policy Analysis, and the Passage of the National Minimum Drinking Age Act of 1984," revise and resubmit, *Risk Analysis*.

Grant, Darren. "Understanding the Decline in Drinking and Driving during The Other Great Moderation."

Cox, Richard, and Grant, Darren. "Are Smarter Drivers Safer Drivers?"

Papers in Process:

Grant, Darren. "The 'Quiet Revolution' and the Cesarean Section in the United States."

Grant, Darren. "Policy Analysis and Policy Adoption: A Study of Three Drunk Driving Initiatives."

Presentations:

At Conferences

Academy of Economics and Finance (2009, 2010)

American Society of Health Economists (2019, 2016, 2014, 2010)

Association for Public Policy Analysis and Management (2014)

Atlantic Economic Association (2000)

Industrial Organization Society (1994)

International Association of Applied Econometrics (2018)

International Conference on Panel Data (2000)

International Health Economics Association (2014, 2011, 2001)

National Association of Forensic Economics (2002)
Public Choice Society (2005, 2011, 2016)
Society of Labor Economists (2015)
Southern Economic Association (1994-1999, 2001-2003, 2007, 2009, 2011-2019)
Texas Camp Econometrics (2014)
Western Economic Association (2008, 2011, 2013, 2015, 2017)

At Universities, Consultancies, or Government Agencies

Texas A&M (2017, 2010); Federal Reserve Bank of Cleveland (2017); Baylor University (2008); Texas Christian University (2007); Western Kentucky University (2007); Wichita State University (2006); University of Montana (2006); University of North Texas Health Science Center (2006); Albany College of Pharmacy (2005); Nicholls State University (2005); Southern Methodist University (2004); Texas Woman's University (2004); University of South Carolina (2001); Georgia State University (2000); Bureau of Labor Statistics (1995); Regional Economic Models, Inc. (1995)

Grants:

SHSU Faculty Research Grant, "The Ballot Order Effect: Evidence from Texas," \$8,000 (with supplementary funds from the SHSU College of Business), Summer 2015.

SHSU College of Business Administration Summer Research Grant, "Explaining the Rise in U.S. Cesarean Rates: 1980-2010: The Role of Labor Market Factors," \$8,000, Summer 2012.

External Research Grant from Choose Responsibility, "Policy and Policy Analysis in the Passage of Traffic Safety Legislation: The Case of the Minimum Legal Drinking Age," \$11,232, Spring 2010.

External Research Grant from Choose Responsibility, "A Multifaceted Study of the Effect of the Minimum Drinking Age on Drunk Driving," \$34,749, Summer & Fall 2009.

External Research Grant from Choose Responsibility, "The Political Economy of Research on the Minimum Legal Drinking Age," \$11,620, Spring 2009.

GSU College of Business Administration Summer Research Grant, "Sample Attrition and Unemployment in the Current Population Survey," \$6,500, Summer 2001.

Georgia Southern University Research Grant, "Race and Cesarean Delivery in Florida," \$3,000, Summer 1999.

Reviewing:

Referee: *American Journal of Managed Care* (2013, 2014, 2015); *American Political Science Review* (2011, 2015); *Applied Health Economics and Health Policy* (2013); *Archives of Public Health* (2011); *B.E. Journal of Economic Analysis and Policy* (2010); *Contemporary Economic Policy* (2010, 2011, 2012, 2015); *Eastern Economic Journal* (2010); *Economics Bulletin* (2014); *Economic Inquiry* (2013, 2016, 2018); *Economics of Education Review* (2006, 2008, 2010, 2011, 2013, 2014, 2018, 2019); *Education Economics* (2007, 2010, 2011); *Empirical Economics* (2019); *European Journal of Law and Economics* (2017, 2018, 2019); *Frontiers of Medicine* (2016, 2017); *Health Economics* (2001, 2002, 2003, 2007, 2008); *Health Policy* (2005); *Industrial and Labor Relations Review* (2003, 2004); *Inquiry* (2009, 2010, 2012, 2015); *International Journal of Health Care Finance and Economics* (2012, 2019); *International Journal of Industrial Organization* (1999, 2000, 2001); *International Review of Law and Economics* (2010); *JAMA: The Journal of the American Medical Association* (2005); *Japanese Economic Review* (2001, 2002); *Journal of Economic Behavior and Organization* (2016, 2019); *Journal of Economic Education* (2016); *Journal of Economic Psychology* (2018); *Journal of Economics and Business* (2001); *Journal of Economics* (2000, 2013); *Journal of Health Economics* (2012, 2013, 2014, 2018, 2019); *Journal of Health Policy, Politics, and Law* (2007); *Journal of Labor Research* (1996); *Journal of Policy Analysis and Management* (2007, 2008, 2016, 2017); *Journal of Public Economics* (2015, 2017); *Journal of Sport Management* (2014, 2015); *Resource and Energy Economics* (2001); *Sage Open* (2018); *Scandinavian Journal of Economics* (2013, 2014); *Scottish Journal of Political Economy* (2011); *Social Science and Medicine* (2011, 2013); *Southern Economic Journal* (1999, 2000, 2013).

Book Reviewer: Borjas, *Labor Economics* (3rd edition); Getzen, *Health Economics: Fundamentals and Flow of Funds* (3rd edition), Goolsbee et al., *Intermediate Microeconomics* (1st edition); Karlan and Morduch, *Economics* (3rd edition); Kuhn, *Personnel Economics* (1st edition); Santerre and Neun, *Health Economics* (4th edition); Gwartney and Stroup, *Economics: Private and Public Choice* (9th edition); Ehrenberg and Smith, *Modern Labor Economics* (7th edition); Folland, Goodman, and Stano, *The Economics of Health and Health Care* (5th edition); and anonymous book and grant proposals.

Occasional external reviewer for tenure applications or reference for citizenship applications. In both capacities I review the individual's research portfolio and comment on its extensiveness and quality.

Significant Activities:

Faculty Mentor, SHSU "Pathfinders" Program, 2015-present.

Faculty Advisor, SHSU Women's Ultimate Frisbee Team (a club sport), 2015-present; SHSU Men's Ultimate Frisbee Team (a club sport), 2019-present; SHSU College Democrats (2019-present); Pi Sigma Epsilon (a marketing fraternity), 1998-2000.

SHSU Committee for the Protection of Human Subjects (IRB), 2013-2021.

Founder and Co-organizer, “Learning to Lead” Lecture Series: 2011-2015.

Served on an ad-hoc committee for the Defense Health Agency, of the U.S. Department of Defense, to prepare and promote a public use data set for use by health economists, 2014-2016; provided technical advice to the Agency for Health Care Administration, State of Florida, in the preparation of their Annual Report on Cesarean Delivery, Fall 2000.

Undergraduate Tutoring Coordinator: GSU Economics Department, 1997-2001; SHSU Economics Department, 2007-2012. Organized and supervised upper-division/graduate students tutoring for statistics and economics principles classes.

Department Seminar Coordinator: GSU Economics Department: 1996-2000; SHSU Economics Department, 2008-2009.

Biweekly Columnist for the *Savannah Morning News* (“The Business Reference,” on topical economics and business issues), April 2000-August 2001; occasional columnist for the *Fort Worth Business Press* on health issues, July 2003-April 2004; semi-monthly columnist for the Huntsville Item (“Running Shorts,” on running), Jan. 2017-present.

References: Available upon request.